CHAPTER 2
MASS APPRAISAL
AGENDA AND OBJECTIVES

A. PRESENTATION TOPICS

1. Definition of “Market Value” and “Mass Appraisal.”
2. Types of information needed to generate a sales file.
3. Types of information needed to generate property values.

QUIZ

4. Types of statistical analyses needed to gage assessment levels and equity.

EXERCISE

5. Types of valuation systems for residential, commercial and industrial properties.

EXERCISE

6. The details of reassessment programs.

B. SESSION OBJECTIVES

1. Participants will understand what determines “Market Value” and how a “Mass Appraisal” is done.
2. Participants will understand what information needs to be included in the sales file.
3. Participants will understand what information is needed to generate property values.
4. Participants will understand the different types of statistical analyses and what they measure.
5. Participants will understand the differences in the types of valuation systems used to value all real property.
6. Participants will understand what is expected of them in undergoing a reassessment program.

CHAPTER 2
MASS APPRAISAL

1.0 OVERVIEW AND DEFINITIONS

1.1 Property Valuation

The primary responsibility of assessors is to value all real and personal property in their municipality each year for tax assessment purposes.

Every three years, these valuations must be reviewed by the Department of Revenue (DOR) and certified as meeting legal standards. Valuations in years between this triennial certification must also meet legal standards, but they are not certified by DOR.

1.2 Market Value

Assessors are required by Massachusetts law to assess all real and personal property at its fair cash value as of January 1 each year.[1] Fair cash value means fair market value, which is the price a willing buyer and a willing seller would settle upon in an open market transaction, *i.e.*, they expended a reasonable effort to determine a price and there are no special circumstances involved.[2]

To determine market value, assessors must evaluate a number of factors that impact the amount a willing buyer and seller would agree to, including:

- **Sales** – The time, volume and price of sales for the same type of property in the general area.
- **Location** – The location of the property.
- **Supply and demand** – The number of properties available for sale relative to the number of buyers seeking them.

1.3 Mass Appraisal

Mass appraisal is defined as the use of standardized procedures for collecting data and appraising property to ensure that all properties within a municipality are valued uniformly and equitably. It is the process of valuing a group of properties as of a given date, using common data, employing standardized methods and conducting statistical tests to ensure uniformity and equity in the valuations.

Assessors use mass appraisal procedures and techniques when determining the fair cash value of properties in their municipalities.

2.0 SALES DATA

2.1 Sales Information

Assessors must gather and analyze property sales data in order to conduct a mass appraisal program. The sales prices of comparable properties that sold in close proximity to the assessment date are the primary indicators of property values in a municipality.

2.2 Sales Identification

Assessors should use a variety of sources to identify all of the real property sales that occurred in the municipality.

2.2.1 Registry of Deeds

The registry of deeds generally sends to each of the communities in its jurisdiction copies of new deeds recorded each month with their book and page numbers shown on the copies. The registry information will generally list all of the real estate included in each sale and disclose the selling price.

2.2.2 Real Estate Transfer Publications

Periodicals like *Bankers and Tradesman* regularly publish information about real estate sales transactions, setting out selling prices, names of buyers and sellers and property classes and uses.

2.2.3 Newspaper Articles

Newspapers frequently contain real estate sections with information about real estate transactions.

2.2.4 Local Real Estate Brokers

Real estate brokers generally have information about property sales. Frequently, they can provide distinctive information, such as what was included in a sale.

2.2.5 Bank and Estate Appraisers

Bank and estate appraisers may also have information about a municipality's sales market.

2.3 Sales Selection

The validity of a sales analysis depends on the identification and selection of arms-length sales.

2.3.1 Arms-Length Sales

An arms-length sale is a transfer of property ownership between:

- A willing seller not under compulsion to sell, and
- A willing buyer not under compulsion to buy.

The transaction is between two unrelated parties, each of which is reasonably knowledgeable of market conditions and under no pressure to buy or sell. The property should be exposed to the market for a reasonable period of time.

A sale is not considered arms-length if there is some special situation that does not reflect market value. Examples of sales not usually considered indicative of market value include sales involving any of the following circumstances:

- **Family sales** - Sales between family members, involving reduced or nominal prices.

- **Foreclosure sales** - Sales involving properties foreclosed by a bank or another lending institution where the creditors are trying to make the best of a bad bargain and willing to sell property at whatever they can get to mitigate their loss.

- **Paper transactions** - Transfers involving businesses reassigning assets for bookkeeping purposes.

- **Donations** - Sales to charitable, educational or religious organizations that involve or are tantamount to donations.

- **Court ordered sales** – Sales ordered by a court that are tantamount to no more than the buyout price between the former co-owners, *e.g.*, a property settlement as part of a divorce.

2.3.2 Sales Verification

Assessors can use a number of methods to determine if a sale involved any special circumstances. These methods include:

- **Sales questionnaires** – Questionnaires are sent to new property owners asking them for details about the sale and if any special circumstances were present.

- **Property visits**– A visit can be made to the property shortly after the sale to interview the new owner about any special circumstances and to inspect the property to determine its condition at the time of the sale.

- **Interviews or phone calls** - The seller can also be interviewed in person or by phone, as can any real estate agents, appraisers or other third parties who have some knowledge of the parties to the sale and the details surrounding it.

2.3.3 Sales Database and Maps

After verifying arms-length sales, assessors should create a sales database containing information about each sale property.

The database should include a photograph of each property depicting the physical condition of the property at the time of sale.

Also included as part of the database should be a set of property maps showing the location of all arms-length sales. Sales maps are a valuable tool for identifying market trends within the municipality. The maps should provide the following information:

- Locations of sale parcels.
- Sale prices.
- Sale dates.
- Property types, *e.g.*, single family home, residential lot, etc.

3.0 TAX MAPS

3.1 Land Valuation Tool

Assessors must prepare tax maps that locate and provide essential land area information about every real property in their municipality. In mass appraisal programs, tax maps are essential to the development and application of a land valuation schedule with accurate measures of market value, such as square footage, front footage and site. The maps must be updated annually to reflect changes in parcel configurations.

3.2 Parcel Identification System

Tax maps establish a unique identification number for each parcel of real estate. Most mapping systems identify the parcels by map-lot number or map-block-lot number. Each map is numbered. If the maps also contain divisions, they are called blocks and are identified by a different number. A unique number is then assigned to each parcel.

3.3 Parcel Information

Tax maps must accurately delineate every parcel and display its land area, based on the legal description in the deed or other title document. All roadways should be displayed and identified by name.

Maps that include the following information about each parcel enable assessors to more precisely analyze market influences:

- **Frontage and depth** - Road frontages and property depth measurements on tax maps assist assessors determine conformity to zoning by-laws and development potential.

- **Zoning, improvements and topography** - Boundaries of zoning areas, diagrams or footprints of buildings and other improvements, and topographical data also assist assessors determine conformity to other land use regulations, such as wetlands protection laws and by-laws.

4.0 PROPERTY INVENTORY DATA

4.1 Property Record Card

Assessors must collect and maintain data on each parcel of real, and each account of personal, property. Accurate property data is essential for developing uniform valuations of comparable properties in a mass appraisal program. This data is usually referred to as a property inventory or record card.

4.2 Real Property Descriptive Data

Property inventories for real property parcels should include the following information about ownership and physical characteristics that may affect valuation:

- **Ownership history** – The current and prior owners, acquisition dates and title references.

- **Land information** – Acreage, frontage and other data needed to apply the land valuation system.

- **Building measurements** – The precise external measurements for each structure on the property in order to calculate usable or living areas.

- **Construction quality** – The quality of the craftsmanship of the builder and the worth and durability of the materials used in the construction of each building and other structure.

- **Story heights** - The story height of each section of all buildings in order to calculate living area above the first floor.

- **Style** -The style of the building, *e.g.*, colonial, ranch, etc.

- **Construction date** – The date of construction of each building, *i.e.*, its age.

- **Current condition** – The current physical condition of every building, *i.e.*, its degree of maintenance.

- **Other amenities** – All other amenities of a property that affect the property's market value, such as additional bathrooms, central air conditioning, garages, swimming pools, sheds and barns.

- **Moderating features** - Any features or characteristics that diminish the property's value, such as easements, nuisances and rights-of-way.

4.3 Property Inspections

Assessors must conduct a periodic, cyclical inspection program to continuously inspect properties to verify and update existing data. The time period depends on a number of factors, such as quality of the original data collection effort, the absence of data on certain characteristics needed to accurately measure market trends in a new valuation system, the frequency of property renovation and remodeling and the level of property reinspections. Generally, DOR certification guidelines require that all properties be inspected at least once every nine years.

4.3.1 Community-wide Data Collection ("Full Measure and List")

A program to recollect all exterior and interior data at one time, *i.e*. a full measure and list program, usually takes place during a relatively short period of time, such as one calendar year. A full measure and list program is time consuming and generally requires the hiring of extra temporary staff or a revaluation company.

4.3.2 Cyclical Data Collection

Assessors using a cyclical program continually check their data over a set period, lasting three, six or nine years, depending on property turnover in their community and their resources. This data collection procedure spreads costs over a longer period and minimizes the need for additional staff.

4.4 New Construction Data

Assessors must collect data on properties that have had new construction, alterations or demolitions each year and update their property inventory records to reflect the physical status of each parcel as of January 1, or June 30 if the municipality has accepted a local option making the physical status of real property on June 30 its condition on January 1.[3]

4.4.1 Building Permits

Assessors should make arrangements to receive copies of all building and demolition permits issued in the municipality so they can identify and collect the following construction data:

- New structures.
- Additions to existing structures.
- Renovations and other remodeling.

4.4.2 Partial Construction Valuation

Assessors must determine the percentage of completion of any new construction on the status date. That percentage is applied to the estimated value of the structure as completed. That amount is then added to the land value to determine the property's valuation for the year.

Example

For fiscal year 1, a new house is 60% complete. The parcel's valuation equals the land value plus 60% of the full value of the house as completed.

For fiscal year 2, an additional 20% of the construction is completed. The parcel's valuation equals the land value plus 80% of the full value of the house as completed.

For fiscal year 3, the house is completed. The parcel's valuation equals the land value plus the completion value of the house.

4.5 Property Data Conversions

When a municipality changes valuation systems, assessors must include as a component of their mass appraisal program a full field review of every parcel. This is required by DOR reassessment program guidelines regardless of whether a new data collection program is being conducted or existing data is being used. The purpose is to ensure the data has been accurately captured and the new valuations are uniform.

4.5.1 Drive-by Inspection

To perform a full field review, assessors should first conduct a drive-by inspection of all properties, checking building style, quality and condition and examining other visible data characteristics.

4.5.2 Physical Inspection

For all properties appearing to have numerous discrepancies in their visible data, assessors must conduct a physical inspection.

4.6 Data Quality Analysis

A data quality analysis is a tool to determine the quality of the existing property data and assess the scope of data collection or verification required as part of a mass appraisal program. Properties are selected at random for inspection and a complete check of all of the information in the existing database is made.

4.6.1 Sample Method and Size

The sample should consist of a randomly selected two to five percent of all properties, and should be representative of all the typical property attributes, in the municipality. The sample should include:

- **Neighborhoods** - Representative properties from all the community's typical neighborhoods.

- **Property types** - Representative properties from each of the residential, commercial and industrial property classes. Within

each class, the sample should contain buildings of all styles, types of construction and age.

4.6.2 Property Data Comparison

The preferred method for inspecting properties and comparing the results is to use blank property record cards and measure and list each property as if it were a new data collection.

An alternative method is to conduct a data verification inspection and mark discrepancies on the existing property record cards at the time of inspection.

4.6.3 Sample Classification

The first step in analyzing the results of the data quality study is to classify the reviewed properties into the following four categories:

- **None** - Properties with no discrepancies found between the existing data and the data obtained upon reinspection.

- **Drive-by inspection** - Properties for which a field review would have identified the discrepancies found, *i.e.*, discrepancies are for features such as building style, quality of construction, condition and/or story height.

- **Exterior measurement** - Properties for which an exterior measurement would have been required to identify the discrepancies found.

- **Interior inspection** - Properties for which an interior inspection would have been required to identify the discrepancies found, *i.e.*, discrepancies are for features such as an extra bathroom or fireplace or a finished living area in a basement or attic that was believed to be unfinished.

4.6.4 Statistical Analysis

A statistical analysis must be completed to evaluate the results of the data quality study.

Step 1 Compute Dollar and Percentage Impact of Discrepancies

- For each property, calculate the dollar difference between the existing assessed value and the value the property would have had if the data had been accurate.
- For each property, determine the percentage difference by dividing the dollar difference by the existing value.

Example	
Assessed valuation	**$100,000**
Valuation with accurate data	**$115,000**
Dollar difference	**$15,000**
Percentage difference	**15%**
	(15,000 ÷ 100,000)

Step 2 **Calculate Mean Dollar and Percentage Difference**

- For the entire sample, and for each of the discrepancy categories identified in Section 4.6.3 above, calculate the mean dollar and mean percentage difference.
- The mean for each is the average difference and is calculated by adding the difference for each property and dividing that total by the number of properties.

Step 3 **Calculate Median Dollar and Percentage Difference**

- For the entire sample, and for each of the discrepancy categories identified in Section 4.6.3 above, calculate the median dollar and median percentage difference.
- The median for each is found by arraying the differences from high to low (or low to high) and locating the midpoint, with an equal number located above and below.

4.6.5 Corrective Action

The results must be evaluated to determine whether corrective actions are needed.

- **Median over 10%** - Assessors should conduct a full data collection program if the median in any category, class or type of property is greater than 10 percent.

- **Median between 5% and 10%** - Assessors should begin a three or six year, cyclical inspection program.

- **Median below 5%** - Assessors should continue ongoing maintenance and carry out a six or nine year, cyclical inspection program.

5.0 MARKET ANALYSIS

5.1 Analysis Period

Once arms-length sales have been identified and verified, assessors must conduct a sales analysis to determine assessment level and uniformity. An analysis is conducted before beginning a mass appraisal program to compare the level and uniformity of existing assessments with the current market and identify the valuation adjustments that need to be made. Once the program is complete, another analysis is conducted to ensure that the resulting values comply with DOR certification standards of fair cash value.

Taxes for a fiscal year are assessed as of the January 1 before the July 1 beginning of that year. January 1 is the effective date of the analysis since assessors are to determine the value of properties as of that date. The sales analysis should be based on sales that occurred during the preceding calendar year.

Example

January 1, 2008 is the assessment date for fiscal year 2009, which begins on July 1, 2008. Calendar year 2007 sales are analyzed for fiscal year 2009.

5.2 Sample Size

Assessors must include all valid arms-length sales that occurred in the analysis period. In the example above, all valid sales that took place in calendar year 2006 would be used.

5.2.1 Minimum Sample

The sample should be at least two percent of the number of parcels in the class or subclass being analyzed, or 10 sales in the class or subclass, whichever is greater. For residential properties, a separate analysis should be conducted for each of the following subclasses:

- Single-family homes.
- Condominiums.
- Two-family homes.
- Three-family homes.
- Apartment buildings (4 units and above).
- Residential vacant land.

5.2.2 Insufficient Sample

If the sample is less than two percent, or 10 sales, the assessors should include an additional 12 months of sales in the analysis in order to obtain an adequate sample. The additional months can be from either the year before the base year, or the six months before and the six months after the base year. The time period used must be the same for all classes and subclasses analyzed that need an additional year.

Example

Calendar year 2007 sales of apartment buildings are insufficient. The assessors use the last 6 months of 2006 and the first 6 months of 2008 to obtain an adequate sample.

The sales study for any other class needing sales in a second year such as single-family homes, condominiums, two-family homes, three-family homes or residential vacant land, must also include sales from those months.

5.3 Time Adjustments

Assessors may need to adjust the sales prices forward or backward to the assessment date before conducting the analysis if the real estate market is changing at a dramatic pace.

5.3.1 Inflation/Deflation Rate

To determine a proper adjustment, assessors should first compute the assessment/sales ratio for earlier months of sales. See Section 5.4.1 below.

Example

An analysis of 2007 sales shows that:

- **January sales were on average 90% of the current assessments.**
- **July sales were on average 85% of the current assessments.**
- **December sales were on average 80% of the current assessments.**

Inflation rose at a 10% rate over the year.

5.3.2 Monthly Trend Factor

Adjustments in the sales price are made by computing a monthly adjustment factor. The factor is calculated by dividing the annual inflation rate by 12 months.

Example

Inflation rose at a 10% rate over the year. The monthly adjustment factor is .83% (10 ÷ 12).

- **October sales occurred 3 months before the assessment date and are adjusted by 2.5% (.83 x 3).**
- **May sales occurred 7 months before the assessment date and are adjusted by 5.81% (.83 x 7).**

5.4 Ratio Studies

Ratio studies are used to analyze existing assessments by (1) assessment level and (2) assessment uniformity. Assessment level measures the degree to which the assessments approximate current market value. Assessment uniformity measures the degree to which properties in the same class or subclass are assessed at the same percentage of current market value.

5.4.1 Assessment Level

5.4.1.1 Assessment/Sales Ratio

Assessment level is determined by calculating the median assessment/sales ratio (ASR) for the class or subclass being analyzed. The first step is to calculate the ASR for each property in the sample. The ASR is calculated by dividing the current assessed valuation of the property by the sales price.

An ASR of 1.00 represents market value. An ASR below 1.00 indicates the property is assessed for less than its market value. An ASR above 1.00 indicates the property is assessed for more than its market value.

Example

A property assessed at $100,000 sold for $135,000. The ASR is .74 (100,000 ÷ 135,000). This property's assessment is below market value, *i.e.*, is 74% of its market value.

5.4.1.2 Median Assessment/Sales Ratio

The median ASR is then calculated for the municipality, class or subclass being analyzed. The median is generally a better measurement of assessment level than the mean (average) because it is not swayed by outlying sales.

Step 1	**Calculate ASRs** • Compute the ASR for each sale in sample.
Step 2	**Calculate Median ASR** • Array the ASRs from high to low (or low to high). • The median is the midpoint, with an equal number of ASRs located above and below.

5.4.2 Assessment Uniformity

Assessment uniformity is determined by calculating the coefficient of dispersion (COD) for the class or subclass being analyzed. The COD

measures how sales prices for properties within the sample vary from the median ASR.

Step 1	**Calculate Absolute Deviation from Median**
	• Compute the amount by which the ASR for each sale in the sample deviates from the median ASR, *e.g.*, if the median ASR is .97 (97%), the deviations for sales with ASRs of .95 and .99 would both be .02.
	• The deviation for the sale or sales that established the median should be calculated and included.
	  • If 1 sale determined the median, the deviation for that sale would be 0.
	  • If 2 sales determined the median, one at .96 and the other at .98, resulting in a median of .97, the deviations for both sales would be .01.

Step 2	**Calculate Average Absolute Deviation from Median** • Add the absolute deviations of each sale in the sample. • Divide the total by the number of sales. **Example** **The total of absolute deviations for a sample of 25 sales is 2.56 (256%). The average absolute deviation is .106 (10.6%) (2.56 ÷ 25).**
Step 3	**Calculate the Coefficient of Dispersion** • Divide the average absolute deviation by the median ASR. • Multiply that quotient by 100. **Example** **The average absolute deviation is 10.6%. The median ASR is 97%. The COD is 10.92 (.106 ÷ .97 x 100).**

5.5 Certification Statistical Standards

5.5.1 ASR and COD Standards

For certification, the sales analysis must indicate the following mass appraisal standards of assessment level and uniformity for each type of property for which there is a sufficient sales sample*:*

Type	Use Classes	Median ASR (Range)	COD (Maximum)
Single-family	101, 103	90-110%	10%
Two-family	104	90-110%	12%
Three-family	105	90-110%	12%
Apartments	111-112	90-110%	15%
Condominiums	102	90-110%	10%
Vacant Land	130-132	90-110%	20%
Commercial	300	90-110%	20%
Industrial	400	90-110%	20%
Mixed Use	013-031	90-110%	20%

5.5.2 ASR Differential

Certification standards also require that the difference in the median ASR of the residential subclass with the largest number of parcels and the median ASR of any other subclass of residential property should be five percent or less. The median ASR for any subclass may go below 90 percent or above 110 percent, as long as the median is within five percent points of the original class median from which the subclass is derived.

Example

The largest or predominate residential subclass is single-family homes and has a median ASR of 97%. All other residential subclasses would have to have a median ASR of 92% to 102% to meet certification standards.

If the median ASR for single-family homes is 92%, all other residential subclasses would have to have a median of 90% to 97%.

5.6 Sales Stratification

Assessors can and should stratify sales in a residential subclass into subgroups in order to more precisely identify the factors influencing market value. Subgroups can be based on such factors as:

- Neighborhood.
- Building style.
- Building grade.
- Building age.
- Selling price.
- Sale date.

The median ASR and COD should be calculated for each subgroup. The median for each subgroup should fall within five percent of the median of the residential subclass. For equity purposes, the subgroup medians should not fall below 90

percent or above 100 percent. The COD for each subgroup should be within the range allowed for the subclass.

Example

The median ASR for single-family homes is 94%. The sales in that subclass are further stratified by building style. The median ASR for each style subgroup should be within 90% to 99%. The COD for each style subgroup should be within 10%.

6.0 VALUATION METHODOLOGIES

6.1 Valuation Systems

Most communities already have a valuation system in place, commonly referred to as a Computer Assisted Mass Appraisal (CAMA) System. These systems have the ability to apply market changes to all comparable properties within the municipality.

6.1.1 Adjustment of Existing Valuation System

Sales analyses and other market data are used to identify what adjustments need to be made to the existing valuation system for improvements and land. This typically involves updating the CAMA system valuation models, such as land, cost and depreciation tables. Adjusting these tables maintains the integrity of the existing system because the values of all comparable properties would change at the same rate.

Examples

The existing land valuation schedule would be adjusted if the source of dispersion appears to be neighborhood differences.

The existing building valuation models, base cost tables or depreciation schedules would be adjusted if the source of dispersion appears to be a specific style or age of property.

6.1.2 Trending or Factoring Existing Valuations

In some cases, sales analyses may be used to adjust the assessments of a group of properties by a uniform percentage, rather than adjusting the CAMA system valuation models. This approach is effective when the underlying data is current and accurate and when separate trending factors are developed for comparable properties (such as by location, age, style, etc.) that appreciated or depreciated in value at the same rate. It may be an inappropriate appraisal technique where values have been previously factored and applying another factor would magnify underlying inequities.

Example

Sales of homes in a particular neighborhood indicate an ASR of 90%. The current valuations of all homes in a particular neighborhood are increased by 10%.

6.2 Residential Property

Residential properties are usually valued using the cost approach. This method calculates the current cost to replace the building using a recognized cost manual, local building costs and/or a cost trending multiplier (from an applicable national cost service). This cost estimate is then adjusted downward for depreciation due to age or condition. Land is valued separately and added to the depreciated cost. The commonly used term for the building component is RCNLD for Replacement Cost New Less Depreciation.

Example

Subject property is a 20-year-old, 2,000 square feet (SF) single family home.

Updated construction costs are $75/SF. The RCN = $150,000 (2,000SF x 75/SF).

Updated depreciation tables indicate a 20-year-old home has lost 10% of its value.

RCNLD = $135,000 [150,000 – 15,000 (10% of 150,000)].

Residential house lot value is $45,000.

Final value is $180,000 (135,000 + 45,000).

6.3 Vacant and Improved Land

The approach to valuing vacant and improved land depends on the sales database. The most reliable method is to analyze sales of vacant, raw land. Additionally, a land residual analysis should be conducted. This method subtracts the value of all improvements on a parcel from its sales price leaving an indicated land value. The results of both approaches should support the adjustments the assessors make to existing land valuation schedules for all classes to ensure that their application reflects current market value.

Example

A single-family home sells for $300,000.

The RCNLD = $200,000.

The residual or indicated land value is $100,000.

6.4 Commercial and Industrial Property

Commercial and industrial properties are bought and sold on investor expectations. In valuing these properties, adjustments should consider the approaches to value that were used to determine their original base values.

Certification guidelines require that assessors use at least two valuation methods to estimate the values of all investment properties.

The three methods used to value commercial and industrial properties are:

6.4.1 Cost Approach

This method calculates the current cost to replace the building, adjusts for depreciation due to age or condition and adds a separately determined land value.

Example

Subject property is a 10-year-old, 20,000 SF office building.

Updated construction costs for this type of structure are $50/SF.

The RCN = $1,000,000 (20,000SF x 50/SF).

Updated depreciation tables indicate a 10-year-old office building has lost 10% of its value.

RCNLD = $900,000 [1,000,000 – 100,000 (10% of 1,000,000)].

Commercial land value is $200,000.

Final value is $1,100,000 (900,000 + 200,000).

6.4.2 Income Approach

This method requires the assessor to estimate the rental income from a property and capitalize that income into an estimate of current value. The approach recognizes that potential buyers demand property because they anticipate a future income stream. Assessors should collect current information on a community and regional level about rents, income, expenses, financing rates and terms and other data needed to develop capitalization rates. The necessary information can be obtained from a questionnaire, interviews with taxpayers, or from third party sources.

The formula that relates income to value under this approach is:

Value (V) = Income (I) ÷ Capitalization Rate (R).

Example

Subject property is expected to provide a perpetual net income of $50,000 a year.

The rate of return on investments of similar safety is 10%.

Final value is $500,000 (50,000 ÷ .10).

6.4.3 Market Approach

This method analyzes recent commercial and industrial sales to develop units of value. These unit values may then be applied to comparable non-sold properties. Sales from surrounding communities with comparable property bases and market influences may also be used for analytical purposes.

Example

A 40,000 SF office building sells for $3,000,000.

The dollar per square foot unit of value is $75/SF (3,000,000 ÷ 40,000SF).

7.0 REASSESSMENT PROGRAMS AND WORKPLANS

7.1 Interim Years

Assessors must value all property at fair cash value as of January 1 each year. In the years between triennial certification, this means they must adjust valuations to reflect changes in the tax base due to new construction, alterations, demolitions or other physical changes. They must also monitor the market and if there has been a change in market conditions, adjust their valuations as needed so that all property valuations reflect current fair cash value.

7.1.1 Valuation Adjustment Plan

Assessors may undertake or complete a valuation adjustment program in years between triennial certification without the prior review or approval of the Bureau of Local Assessment (BLA). Appropriate analytical and appraisal methods must be used to develop any valuation adjustments. Once the program is completed, the new valuations must be equitable and consistent within and between all property classes, *i.e.*, they must meet the same mass appraisal measures of assessment level and uniformity as required for triennial certification. See Section 5.5 above.

Example

Initial analysis indicates the following ASRs for subclasses of residential properties:

- **75% Single family.**
- **70% Condominiums.**
- **95% Vacant land.**
- **96% Two-family.**

Assessors must adjust single family and condominium valuations. After adjustments are made, all residential subclasses must have ASRs between 90-110% and the ASRs must be within 5% of each other.

Assessors must prepare and retain documentation supporting the new valuations. This documentation might include, for example, income, expense and capitalization rate analyses, sales ratio studies or any other data that support the type and extent of the valuation changes made by the assessors.

7.1.2 Valuation Adjustment Report

Assessors must report the results of their analyses to BLA whether or not any valuation adjustments are made. The report is made on the form "Interim Year Adjustment Report." It should be submitted as early as possible during the tax rate process, but must be received by the time the Form LA-4 "Assessment/Classification Report" is submitted.

7.2 Certification Year

Assessors must develop a reassessment program for meeting triennial certification requirements and submit a workplan to accomplish it to BLA.

7.2.1 Evaluate Current Capability

Assessors must thoroughly evaluate the resources available to them to complete a reassessment program, including the following:

7.2.1.1 CAMA System

The current CAMA system must be evaluated to determine if it has the capability to maintain the database, update the current valuation tables and produce required certification documentation.

7.2.1.2 Personnel

A reassessment program requires a substantial amount of time and labor. Assessors must determine if they have sufficient, qualified personnel to complete the program in-house in a timely manner. In-house personnel must have the appraisal knowledge, training and experience, and working knowledge of the CAMA system, required to complete assigned tasks.

7.2.1.3 Professional Assistance

Assessors may contract for professional assistance if they determine that in-house resources are not sufficient to complete all or portions of the program. Assessors may select from a wide range of data processing, appraisal, consulting or other professional services to revalue property, update an existing valuation system or otherwise assist them. Assessors are legally responsible for ensuring that valuations meet legal standards even if professional assistance is used.

If the plan includes any professional assistance, assessors should review procurement procedures and standards with their

procurement officer and municipal counsel. The Uniform Procurement Act[4] covers procurement of professional services generally, but the specific bidding procedures that apply depend on the type and value of the contract. Additional information is available from the Office of the Inspector General at www.mass.gov/ig. There may also be local bidding provisions that apply.

Assessors should consider a number of factors in addition to cost when choosing a contractor, including the contractor's:

- Familiarity with the municipality and area.
- Familiarity with the CAMA system used.
- Experience working with municipalities of similar size and complexity.
- Performance record.

7.2.1.4 Budget

Assessors must review the financial resources needed to implement and complete the program, prepare a program budget and request any additional funds needed. Funds should be appropriated two years in advance of the year certification is scheduled.

7.2.2 Prepare Workplan

Assessors must determine the program components needed to meet certification standards based on their analysis of market trends, data quality, CAMA system capability and BLA certification recommendations.

They must then prepare a workplan to document program components, personnel and timetable. The workplan is a valuable tool that allows assessors to:

- Define specific project tasks.
- Manage their limited human and financial resources.
- Monitor the progress of the program.

The workplan submitted to BLA includes following:

- Data maintenance and valuation system information.
- Program data collection, valuation and field review components for all property classes and who is responsible for completing them, in-house personnel or a contractor.
- Public disclosure activities (Individual impact notices required for certification only for full revaluation programs, *i.e.*, new data collection and valuation system).
- Appropriation status.

- Schedule for completing major steps in certification process. BLA will not accept a workplan unless a work schedule with projected completion dates is submitted.

For their own monitoring purposes, assessors should prepare a more detailed project workplan based on realistic estimates of the necessary work and time needed to complete it.

[1] G.L. Ch. 59 §38.
[2] *Boston Gas Company v. Assessors of Boston,* 334 Mass. 549 (195641) defines fair cash value as "fair market value, which is the price an owner willing but not under compulsion to sell ought to receive from one willing but not under compulsion to buy."
[3] G.L. Ch. 59 §2A(a), as added by Ch. 653 §40 of the Acts of 1989.
[4] G.L. Ch. 30B.

Interim Year Adjustment Report
Bureau of Local Assessment - Department of Revenue
FY2009

City/Town/District
Municipality

Sales Ratio Sutdy for the Period _____ through _____

Property Class	101	102	104	105	109, Misc	111-112	130-132	300's	400's
# Parcels									
Total # Sales									
# Arms-Length Sales									
% AL Sales/Parcels									
Use Prior FY Assessed Values									
Prior Median ASR									
C O D									
Use Current FY Assessed Values									
Current Median ASR*									
C O D*									

** Statistical study results must conform to requirements as outlined in the "Guidelines to a Minimum Reassessement Program", section IIIB.*

Commercial & Industrial

Have properties been reviewed ☐ Yes ☐ No **Have properties been adjusted?** ☐ Yes ☐ No

If adjusted, did you change: ☐ Capitalziation rates ☐ Rent Schedules ☐ Vacancy Rates ☐ Land values
☐ Building Costs recalibrated ☐ Depreciation tables ☐ Other adjustments (explain):

We, the undersigned, agree that in our judgement the valuation adjustments results in fair and equitable assessments both within and between all classes of property. Sufficient documentation has been developed to support all valuation adjustments and will be retained for 5 years.

Submitted by the Board of Assessors _____ _____ _____
_____ _____ Date: _____

Massachusetts Department of Revenue
Division of Local Services
Bureau of Local Assessment

Revaluation Workplan

Community	FY	Submitted by:	Position	Date

Background

Since the last certification:	Residential	Mixed use/C&I	Personal Property
New valuation system	Yes No	Yes No	Yes No
If yes, name of new system			
Installation completed	FY	FY	FY
Has your department done a formal data quality study?	Yes No date_____	Yes No date_____	
Is there a cyclical reinspection program in place?	Yes No	Yes No	
If yes,	number of years _____ ending FY _____ % properties completed to date _____	number of years _____ ending FY _____ % properties completed to date _____	
System on which your personal property accounts are listed and valued:			
504/local utilities: net book Yes ☐ No ☐ If no, appraiser/contractor*			
Electric generation plant: Yes ☐ No ☐ If yes, agreement or appraiser/contractor*			

Program Components

	Residential		Mixed use /C&I		Personal Property	
	Inhse	Contractor Name*	Inhse	Contractor Name*	Inhse	Contractor Name*
Data field review						
Full Field Review						
All aspects						
OR: Data Collection						
Valuation						
Val. Field Review						

New mapping program? ☐ Yes ☐ No If yes, contractor's name _____ Last updated: _____

Impact Notices: Yes ___ No ___ Classes: _____

Adequate Funds for Revaluation: Appropriation approved: _____ Pending: ___ Denied: ____

Work Schedule Dates**

	Anticipated completion
Sales analysis	
Value generation	
Value review	
DOR review	
Public disclosure	
Tax rate set	

Additional Information: _____

* Please list contractor(s) if known.
** Indicate a complete proposed work schedule. Major changes will require a revised work schedule.
Revised 1/99

MASS APPRAISAL
ADDITIONAL RESOURCES

The following are additional resources on Mass Appraisal produced by DLS that are available on our website: www.mass.gov/dls.

- ***Guidelines for Development of Minimum Reassessment Program (February 2006)*** – Explains requirements for developing reassessment programs that will result in fair cash values meeting triennial certification requirements. Addresses sales analyses, property inspections, valuation methodologies and public disclosure programs. **Supplements the course handbook**.

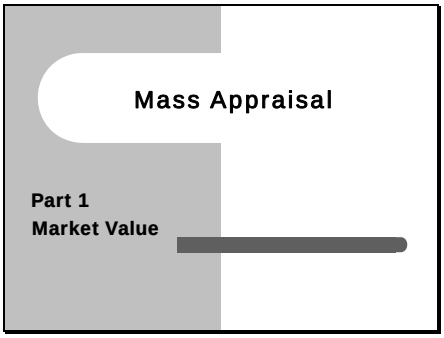
- ***In-house Revaluation Cost-Benefit Analysis (March 2003)*** – Provides framework for local assessors to evaluate the activities required to complete an in-house revaluation program and determine the associated costs.

- ***Assessment Certification Manual and Spreadsheets*** – Explains requirements for documenting sales analysis and valuation methodology during triennial certification review.

- ***Property Type Classification Codes (March 2005)*** – Guidelines that establish coding system assessors must use in designating usage classification of property. **Supplements the course handbook.**

- ***Guidelines for Annual Assessment and Allocation of Tax Levy*** – Annual Informational Guideline Release (IGR) that details standards and procedures for annually determining property tax assessments, including triennial certification, classifying property according to use and allocating the tax levy among the property classes.

Slide 1



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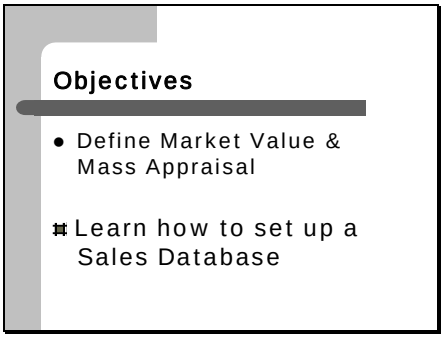

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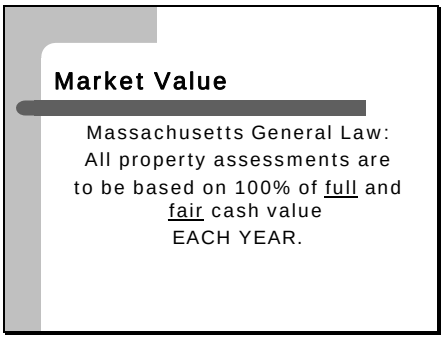

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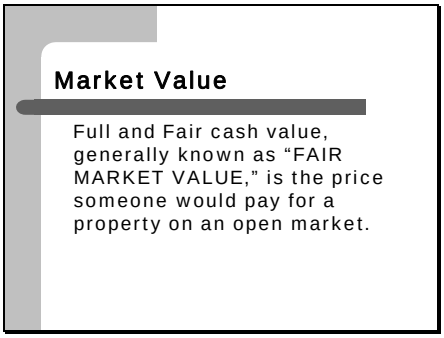

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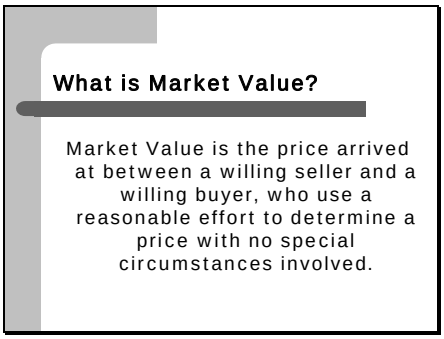

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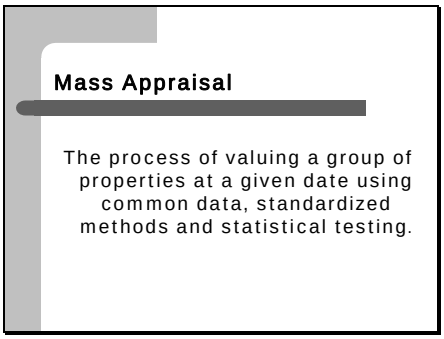

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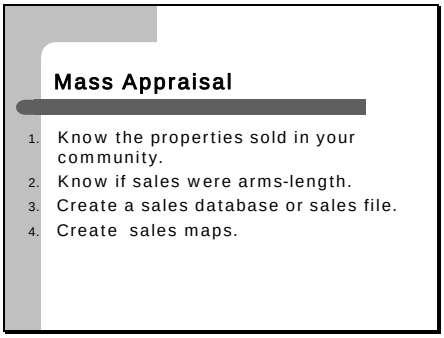

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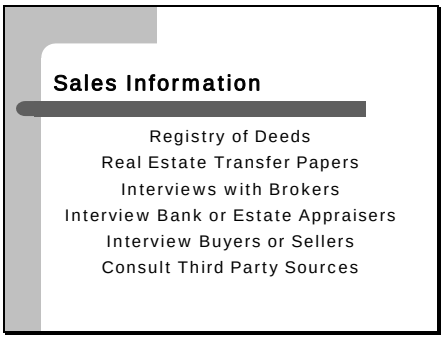

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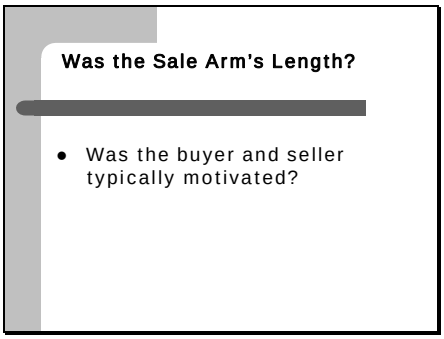

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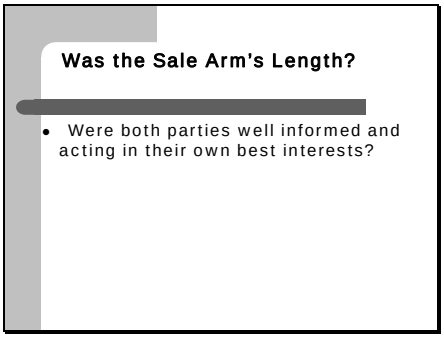

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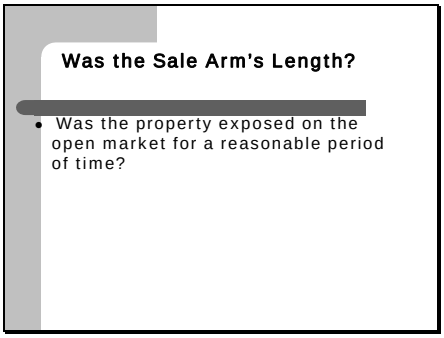

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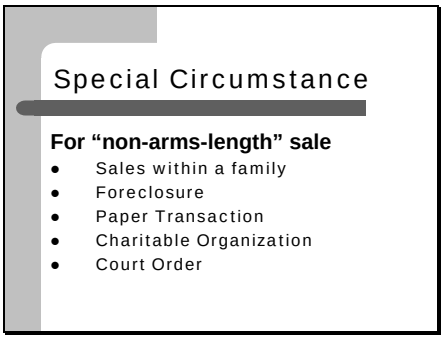

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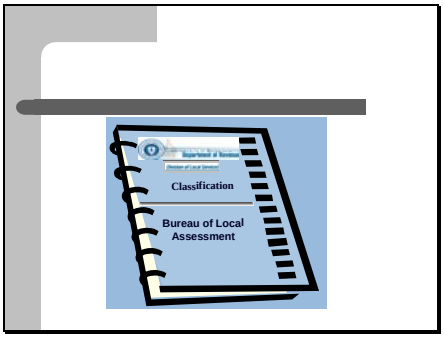

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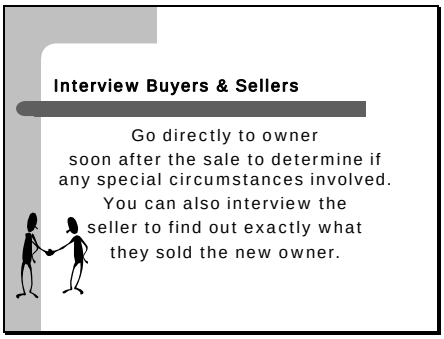

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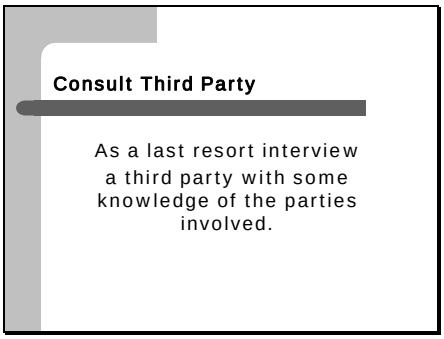

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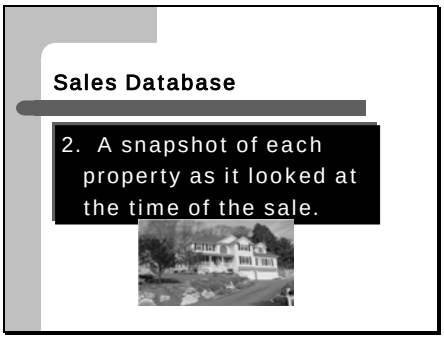
Slide 18



Slide 19

Sales Database

3. Property maps showing each parcel, its selling price, sales date and description.

Slide 20

Summary

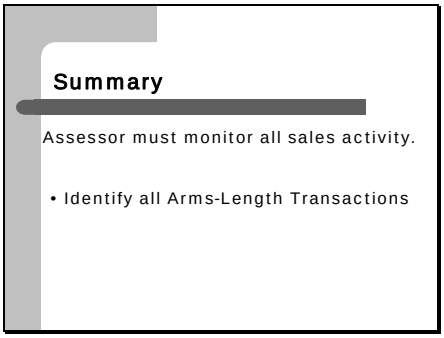
Market Value is the price arrived at between a willing buyer and a willing seller, who use a reasonable effort to determine a price with no special circumstances involved.

Slide 21

Summary

Mass Appraisal is the process of valuing a group of properties at a given date using common data, standardized methods and statistical testing.

Slide 22



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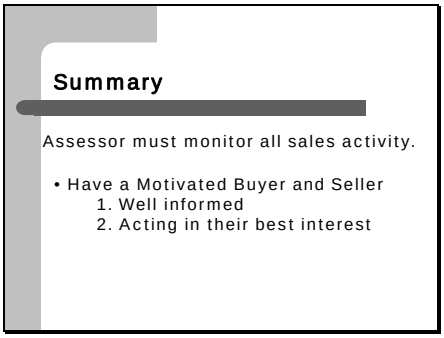

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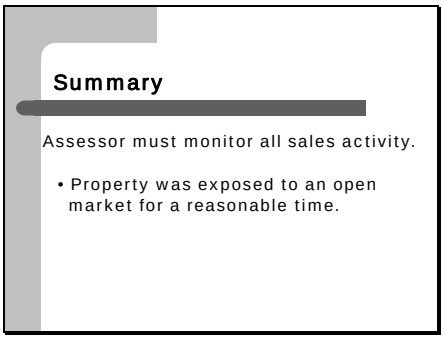

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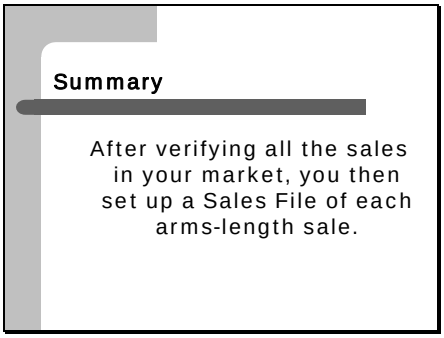

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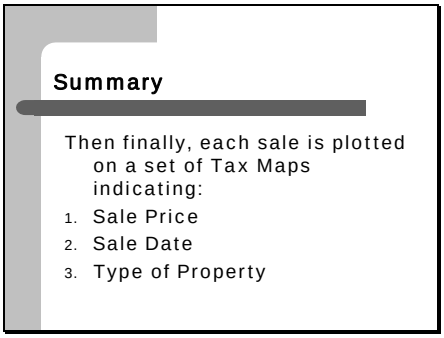

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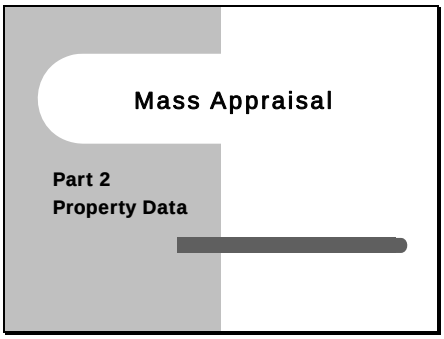


Slide 28

Objectives

- Tax Maps
- Property Inventory
- Quality of Data for Property in your Community

Slide 29

Market Value

- Know all of the property's attributes at the time of sale
- Every properties new value will be based on its current physical description as of the assessment date of the appraisal
- First, identify every property in the community

Slide 30

Tax Maps

Basic Information:

- Identification number
- The size of the property
- The street names

Slide 31

Tax Maps

- **An identification number**
  - A map number
  - Number that signifies a block within the map
  - A unique number to the parcel different from other numbers in the map or block
- **Total area of the parcel**
  - Ideally the same as the current deed
- **All road names**

Slide 32

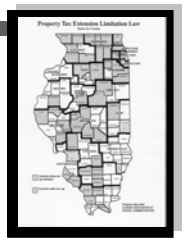
Ideal Tax Maps

- **Frontage that abuts the road**
- **Depth, in feet, from the road**
- **Zoning within the map**
- **Outline of each building on the lot, if any**
- **Street number for each lot located on the roadway**
- **Topography, (elevations, wetlands, water-bodies…)**

Slide 33

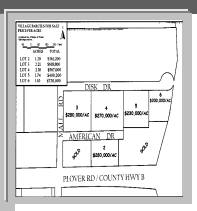
Maintain Tax Maps Annually

Tax Maps need to be maintained annually showing any changes



Slide 34

Tax Maps



Such as when one parcel is broken into more than one, or when more than one parcel is combined into only one.

Slide 35

Descriptive Data

So . . .

What is the data needed for all properties?

Slide 36

Complete Listing of Data

For every parcel in the community you need all the data that pertains to that parcel.

Slide 37

Complete Listing of Data

Every Community should have a Property Record Card Listing each parcel's "Property Inventory Data"

Slide 38

What is the Data Needed?

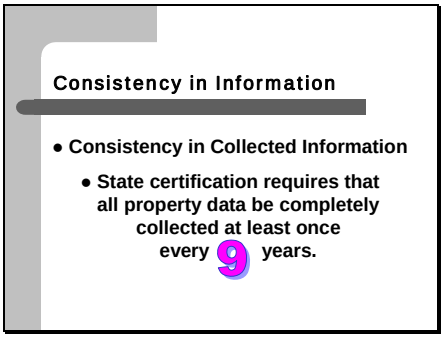
- **Precise Building Measurements**
- **Grade for Each Building "Quality of Construction"**
- **Building's Story Height**
- **Building Style**
- **When the Building was Built**

Slide 39

What is the Data Needed?

- **Current Condition**
- **List of Additional Building Amenities**
- **Easements**
- **Last Inspection Date**

Slide 40



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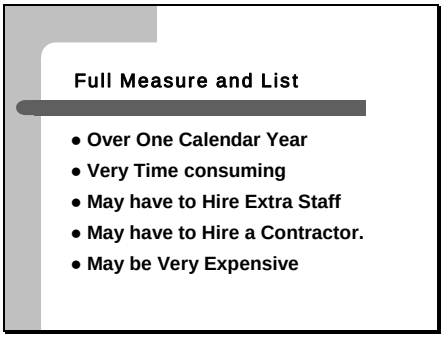

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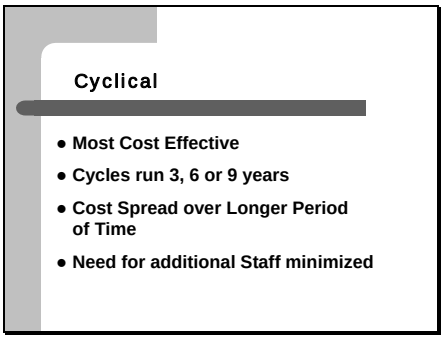

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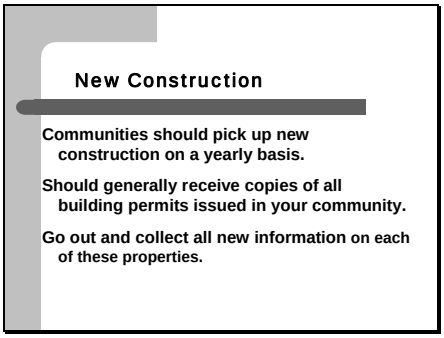

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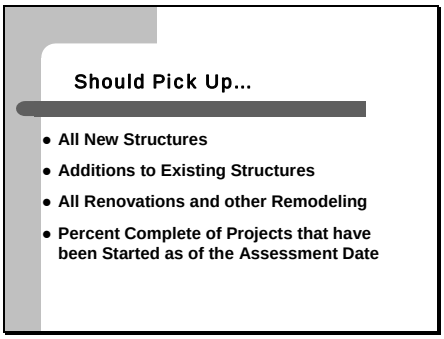

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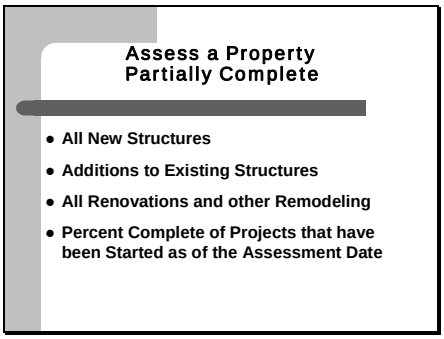

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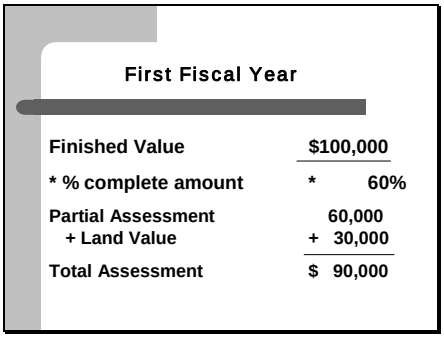

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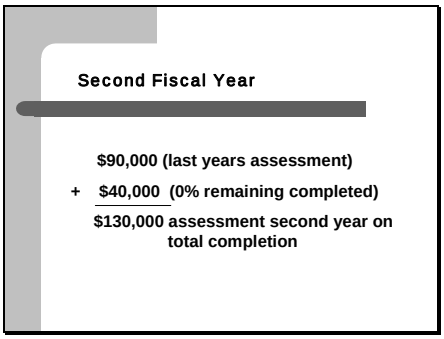

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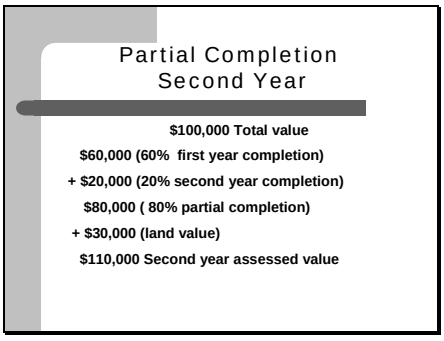


Slide 49

Property Data Conversion

Certification requires that in order to ensure the accuracy of a data conversion, a community must conduct a full field review of each property.

Slide 50

Drive by Inspection

1. **Check Building Styles**
2. **Building Quality**
3. **Condition**
4. **Review all Visible Amenities**

Slide 51

Data Quality Analysis

- **Determines the Quality of Existing Data**
- **Sampling of Parcels done on Properties that have not been Updated**

Slide 52

Sample

- Should Range from 2 to 5% of all properties
- Should Randomly be Selected
- Should Represent all Unique Attributes within the Community
  - Residential (including all subclasses)
  - Commercial
  - Industrial

Slide 53

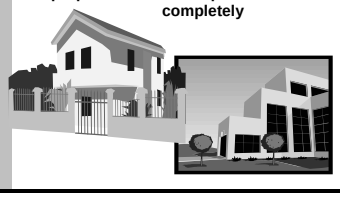
Sample (continued)

- Within Classes Include:
  - Each Building Style
  - All types of Construction
  - Buildings of all ages
  - Anything else important to the evaluation

Slide 54

Sample (continued)

- All properties in the Sample should be checked completely



Slide 55

Data Quality Study

- **Best Method:**
- **Fill a blank property record card out as if it was being filled out for the first time. This way the following decisions won't be influenced by what was done in the past.**
- **Quality of Construction**
- **Condition**
- **Story Height**

Slide 56

Data Quality Study

- **Take the New Information and Compare it to the Old Information on File**
- **Recalculate the Value and compare it to the Existing Value to Determine the overall Impact**

Slide 57

Data Quality Study

Most cost efficient approach is to use the existing data card and review the property in the field.

Slide 58

Result Segments

- No Discrepancies
- Field Review to Identify Problems
- Re-measurement
- Complete Interior Inspection


Slide 59

Statistical Analysis

- Judge how any changes found in the data affect the property's value.
- Evaluate the impact between the original value to a new value based on all changes.
- Calculate the percent difference between the changed value and old original value.

Slide 60

Statistical Analysis

- Take the existing assessment
- Recalculate the value of all changes found during the data quality inspection.
- Find the value difference between the original assessment and the updated assessment.
- Take the value difference and divide it by the original assessment to get the percentage of change

Slide 61

Example

- For each property in the entire sample take the existing assessment
- For example: $100,000
- The New Value comes in at $115,000
- The Updated Assessment is a difference of $15,000
- Take the $15,000 and divide it by the Original Assessment and you have 15%

Slide 62

Example

Existing assessment $100,000

New Value $115,000

Value Difference $115,000-$100,000=$15,000

Value Difference/Original Assessments = Percent of Change

V.D. $15,000

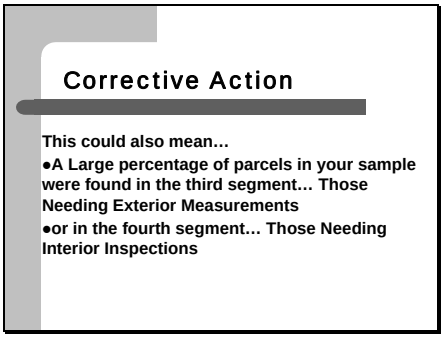
O.A. $100,000 =15%

Slide 63

Corrective Action

If Your Community's Value Impact has an Average and Median in Excess of 10% the Community should consider conducting a full collection program.

Slide 64



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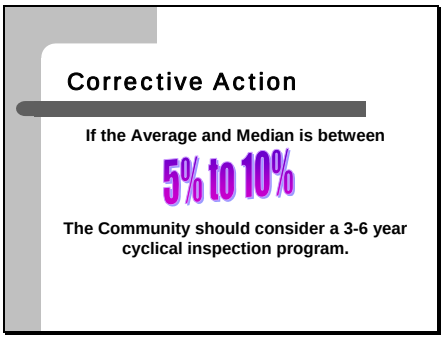

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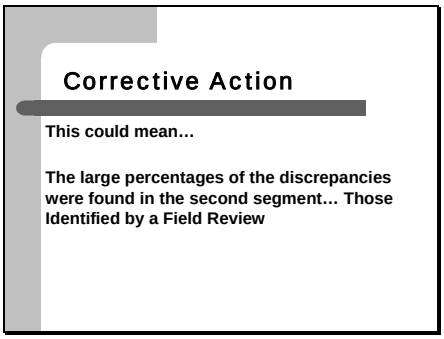


Slide 67

Corrective Action

An Average or median of less than

5%

Indicates a community should continue their ongoing data maintenance program along with a longer-term cyclical program from 6-9 years.

Slide 68

Corrective Action

This could indicate…

A larger percentage of your entire sample fell in the first segment where no discrepancies were found and with the second largest falling in the second segment.

Slide 69

Summary
Tax Maps

- A Parcel Identification Number
- A Parcel's Total Land Area
- The Street Name that is near each Parcel

Tax Maps

Slide 70

Summary
Continually Maintain Property Data

- A complete Inventory that contains all of the attributes of the Parcel Regularly collecting all new construction
- Visiting every property at least once every nine years using
- A Full Measure and List Program – One Year
- Cyclical Inspection Program – over a longer period of time

Property Data

Slide 71

Summary
Data Quality Analysis

- Collecting it with a Blank Property Card
- Going to the property with the existing card and making any needed changes.
- This could indicate type of collection program needed

Data Quality Analysis

Slide 72

Summary
Maintaining Your Database

Based on Your Results...

Determine the Best Approach to Maintain Your Database in the Future

Slide 73

Mass Appraisal

Part 3
Market Analysis

Slide 74

The Valuation Process Objectives

- Analyze the Market.
- The amount of sales needed.
- How to determine if you need to adjust.
- How to perform a ratio study.
- How to judge results.

Slide 75

Assessment Date

For Certification in Fiscal Year 2009 the date of assessment is

January 1, 2008.

Slide 76

Guidelines

All valid sales in the base year have to be used.

For example:

For FY 2009 – all valid sales that took place in 2007 are used.

Slide 77

Guidelines

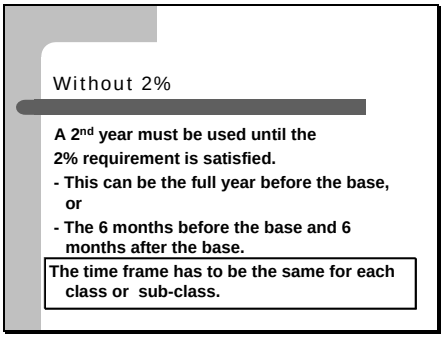
Within the residential class, the total number of valid sales needed is 2% of the total parcels in each subclass.

Slide 78

Subclasses in residential class include:

- ✓**Single Family Houses**
- ✓**Two Family Houses**
- ✓**Three Family Houses**
- ✓**Apartment Buildings – 4+**
- ✓**Condominiums**
- ✓**Residential Vacant Land**

Slide 79



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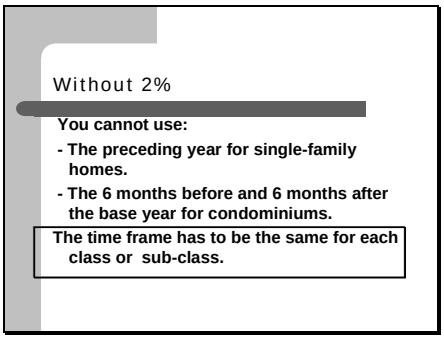

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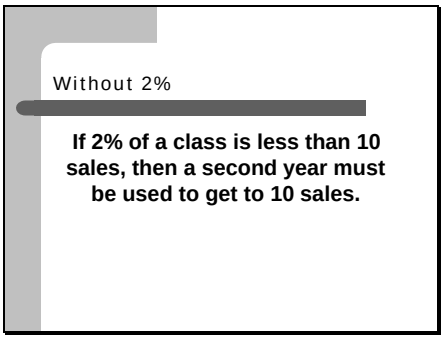

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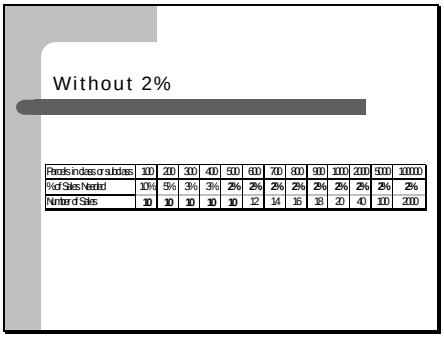

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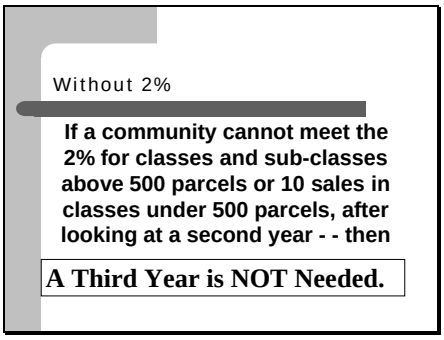

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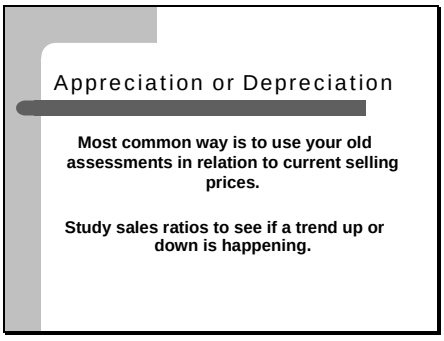

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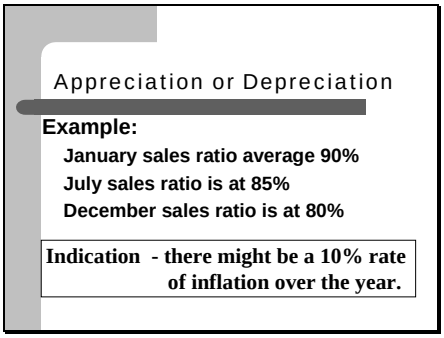

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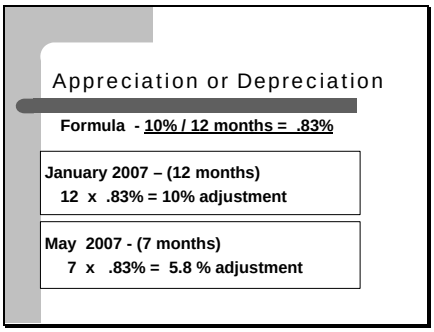

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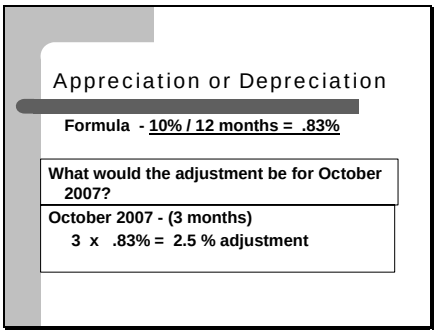


Slide 88

Ratio Studies

Ratio studies are done at the beginning of the process to find out where assessments fall within the market and to identify areas that may need adjustments.

Ratio studies are also done at the end of the process to insure certification guidelines have been met.

Slide 89

Ratio Studies

Check for communities assessment level for each class or sub-class by finding:

the Median Assessment Sales Ratio (ASR).

Check for uniformity of your assessments by finding :

the Coefficient of Dispersion (COD).

Slide 90

Ratio Studies

First - - you need to calculate the Assessment Sales Ratio

- - find the base value

The Assessed Value

Slide 91

Calculating the Sales Ratio

Find the current assessed value $ 100,000

Selling Price or adjusted selling price $ 135,000

= 74%

Slide 92

Calculating the Sales Ratio

Assessment ratios that are less than 100% are below market value.

Assessments that are more than 100% are above market value.

Slide 93

Certification Standards

State Certification Guidelines require measuring the level of assessments by using the median ratio for each class and/or sub-class.

Slide 94

Median Assessment Sales Ratio

List valid sales from by sales ratios: low to high - or high to low.

If a sub-class had 25 sales – the median would be 13. 12 higher and 12 lower

- - if that ASR is 97% that is the median.

Slide 95

Median Assessment Sales Ratio

List valid sales from by sales ratios: low to high - or high to low.

If a sub-class had 24 sales – you would take the average of the 12 and 13 sale. 11 higher and 11 lower

If the 12th has an ASR of 96%, and the 13th has an ASR of 98%

the average ASR would be 97% .

Slide 96

Coefficient of Dispersion

Determines if the assessments are consistent and uniformed in the class or sub-class

State Certification Guidelines specify the acceptable Coefficient of Dispersion for each class.

If the COD is higher or lower – the assessments are not acceptable.

Slide 97

Coefficient of Dispersion

First – determine the amount other assessment sales ratios deviates from the median. This give the absolute deviation.

Example:

Median is 97% - another ratio is 95% - deviates 2%
another is 99 % - deviates 2%

Slide 98

Coefficient of Dispersion

You also calculate the deviation from the sales that determined the median.

Example:

If it were 1 sale that determined the median – the absolute deviation would be 0%

If 2 sales determined the median one at 96% and the other at 98% - the median would be 97% - and the absolute deviation would be 1%

Slide 99

Coefficient of Dispersion

Next - sum up all the absolute deviations in the class or sub-class **256%**

Then - divide the sum by the size of the class or sub-class. This give you an average of the absolute deviations. **25 Sales**

256% / 25 = 10.6%

Slide 100

Coefficient of Dispersion

– Divide the average absolute deviation by the median

10.6% / 97% = 10.9%

and then multiply by 100.

.1092 x 100 = 10.92

Slide 101

Certification Standards

In most communities, the predominate sub-class in the residential class is single family.

If the median is 97%

Then all other sub-classes in the residential class need to be in the range of

92% and 102%

Slide 102

Certification Standards

For Example

With a single-family median of 97%

If the median in the subclass of condominiums is 90%, this would fall 7% below the single-family median.

More work would need to be done to raise the median at least 2%.

Slide 103

Certification Standards

Medians for a class or sub-class cannot
fall below 90% or
raise above 110%
even if they meet the 5% rule.

Slide 104

Stratified into Subgroups

Neighborhood
Building Style
Building Grade
Building Age

Selling Price
Date of Sale

in the condo class - complex

Subgroup medians should be within 5% of the overall median.

Slide 105

Stratified into Subgroups

The median for condos is 94%.
- **Break into subgroups by complex.**
- **Each complex should fit between 89% and 99%.**

Subgroups can fall outside of the 90% and 110% guideline as long as it fits the 5% rule.

Slide 106

Summary

Date of Assessment is the preceding January 1 of the FY.
Example –
For FY 2009 – Date of Assessment is January 1, 2008

Slide 107

Summary

- **Assessments for FY 2009 are based on calendar year sales from 2007.**
- **You need 2% valid sales in a class or subclass for over 500 sales and at least 10 sales for under 500 sales.**
- **You can use a 2nd year to meet this requirement.**

A 3rd year is not needed.

Slide 108

Summary

- **Sometimes you need to adjust sales for inflation or deflation.**
- **To measure the fairness, you need to perform ratio studies.**
  - **Your statistics need to meet State Certification Guidelines.**

Slide 109

Mass Appraisal

Part 4
Valuation Methodology

Slide 110

Goal

Introduce

- ✓ **Mass appraisal valuation methodologies to estimate the value in all major property classes.**
- ✓ **The various components that comprise a triennial certification plan.**

Slide 111

Upon Completion...

Understand what a CAMA system is and the principles upon which it operates.

Slide 112

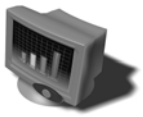
Like any valuation method

The more accurate the data the more accurate the final value estimate.

Slide 113

Today…

Most communities have a valuation system in place called Computer Assisted Mass Appraisal system or CAMA.



Slide 114

For Example:

1. **Are the sales used collected from the correct time period?**
2. **Are the sales arms-length?**
3. **Does the listing information accurately describe the building and land?**



Slide 115

Changes to CAMA

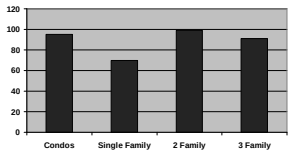
Updating

- **Land Tables.**
- **Cost Tables.**
- **Depreciation Tables.**

Slide 116

Trending or Factoring

Applies an adjustment percentage to specific groups of properties as opposed to the entire database.

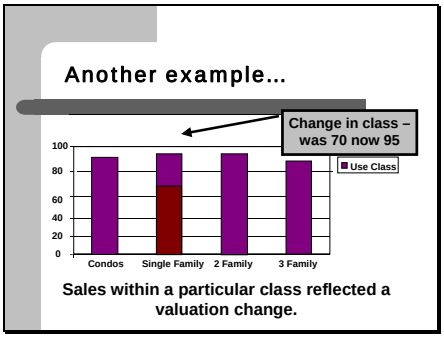


Slide 117

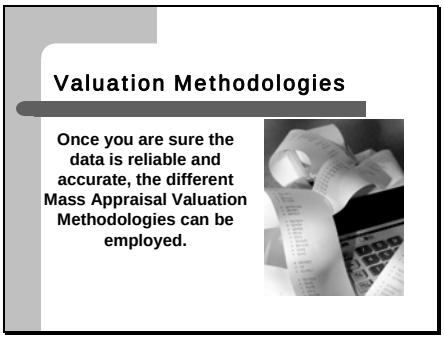
Trending or Factoring

If sales in a particular neighborhood indicated an increase in value, that adjustment would apply to the homes in that neighborhood.

Slide 118



Slide 119



Slide 120

Slide 121

Residential Properties

Valued using a method known as the Cost Approach.

Cost to reconstruct the building
- Depreciation
+ Value of Land

Slide 122

Residential Properties

The commonly used term for the building component is RCNLD or Reconstruction Cost New Less Depreciation.

Slide 123

For example:

- 20 year old, 2,000SF Single Family Home. Updated construction costs are $75SF.

2,000 X $75 = value of $150,000

This is the Reconstructed Cost New or RCN

Slide 124

Example cont.

- Updated depreciation tables indicate a 20 year old home has lost 10% of its value.

10% of $150,000 = $15,000

Slide 125

Example cont.

Therefore the RCNLD would be

$150,000 - $15,000 = $135,000

Slide 126

Land

The last step is to add the value of the land.

The next type of property to consider is valuation of Land.

Slide 127

Land Value

- Analyze available vacant raw land sales.
- Land Residual Analysis.

Residential Sale Price
–
Value of all improvement
Indicated Land Value

Slide 128

Land Residual Analysis

- Sale Price $300,000
- RCNLD $200,000
- Sale Price ($300,000)-
- RCNLD ($200,000)=($100,000)

Indicated Land value = $100,000

Slide 129

Vacant Raw Land Sales

Another method

- A buildable lot sells from one owner to another for $100,000.
- The indicated land value is $100,000.

Slide 130

Commercial & Industrial

Are bought and sold on investors' expectations. There are 3 acceptable methods for valuing commercial and industrial properties.

Slide 131

Commercial & Industrial

- **Cost Approach.**
- **Income Approach.**
- **Market Approach.**

Slide 132

Commercial & Industrial

State certification guidelines require the use of 2 approaches to make final value estimates.

- **Cost Approach.**
- **Income Approach.**
- **Market Approach.**

Slide 133

1. Cost Approach

The Cost Approach is the same method used to value residential properties and works on the same principles.

Slide 134

1. Cost Approach Example

- 10 year old, 20,000SF office building.
- Construction costs are $50SF.

$50SF X $20,000SF =

RCN of $1,000,000

Slide 135

1. Cost Approach Example

- Updated depreciation tables indicate a 10 year old office building has lost 10% of its value.

$1,000,000 X .10 = $100,000

- The RCNLD would be

$1,000,000 - $100,000 = $900,000

The last step is to add the value of the land

Slide 136

2. Income Approach

- Assessor estimates the rental income from a property and capitalizes that income into an estimate of current value.

Slide 137

2. Income Approach Formula

V = I/R

- V = Value
- I = Income
- R = Capitalization rate

Slide 138

2. Income Approach Example

- A property is expected to provide a perpetual income of $50,000 a year.
- The rate of return on investments of similar safety is 10%.

Income ÷ Capitalization rate = Value

Slide 139

2. Income Approach Example

Income ÷ Capitalization rate = Value

Yearly Income is $50,000
Cap Rate is 10%

$50,000/ .10 = $500,000

Slide 140

2. Income/Expense Information

Can be obtained from:

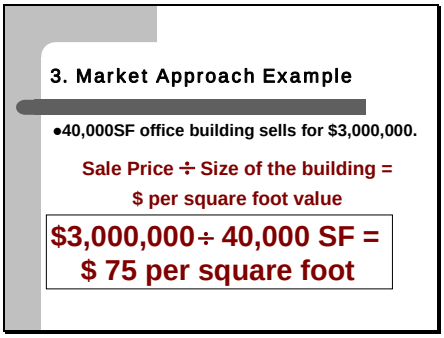
- **Questionnaires**
- **Interviews with taxpayers**
- **Third party sources**

Slide 141

3. Market Approach

Analyzes recent commercial and industrial sales to develop units of value, which may be then applied to comparable non-sold properties.

Slide 142



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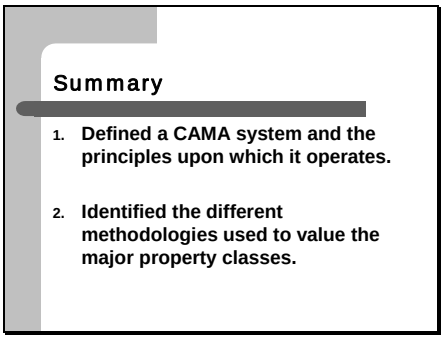

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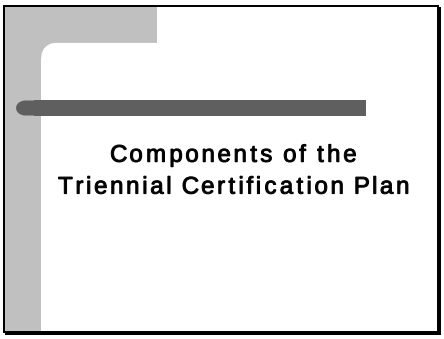


Slide 145

Triennial Certification Plan Objectives

1. **Understand what Triennial Certification is.**
2. **Know what Interim Year Adjustments are and how they must be made.**
3. **Understand factors involved in completing a certification program**
4. **Become familiar with the different components that make up a Certification Workplan.**

Slide 146

Triennial Certification Plan

Massachusetts General Law requires:

Every 3 years, every community's assessments of all property classes be reviewed and certified by the Bureau of Local Assessment as being at full and fair cash market value.

Slide 147

Example

- **Initial analysis indicates an overall ASR of**
  - ✓ **single family class at 75**
  - ✓ **condominium class at 70%**
  - ✓ **vacant land class at 95%**
  - ✓ **multi family class at 96%.**

Slide 148

Interim Year Adjustments

Slide 149

Resources needed to complete a scheduled Certification Program

Slide 150

Resources

1. **CAMA system**
2. **Personnel**
3. **Staff**
4. **Funds**

Slide 151

Resources

- Assessors may select from a wide range of data processing, appraisal, consulting or other professional services to revalue property, update existing valuation or assist.

Slide 152

Resources cont.

If the plan includes any professional assistance, an appropriate contract must be prepared.

Slide 153

Resources cont.

Regardless of the assistance

The **Local Board of Assessors is still responsible** that all values are at full and fair cash value.

Slide 154

Resources cont.

The Bureau of Local Assessment recommends that **funds necessary to complete the certification are in place 2 years before certification year** to allow for timely completion.

Slide 155

Uniform Procurement Act

MGL Chapter 30B. The Inspector General's office provides guidance regarding procurement issues (617-727-9140).

Slide 156

Choosing a Vendor

- Review the contractors familiarity with the area.
- Review their familiarity with your computer system.
- Check their past history with communities the same size and complexity as yours.
- Contact previous customers.

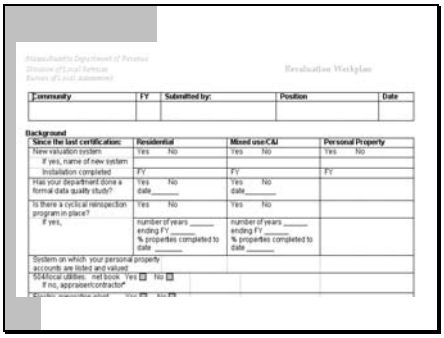
Slide 157

Workplan

A workplan is a tool the assessors can use to:

- **Define specific tasks.**
- **Manage their limited human and financial resources.**
- **Monitor the progress of the program.**

Slide 158



Community	FY	Submitted by:	Position	Date

Background

Since the last certification:	Residential	Mixed use/C&I	Personal Property
New valuation system	Yes No	Yes No	Yes No
If yes, name of new system			
Installation completed	FY	FY	FY
Has your department done a formal data quality study?	Yes No date_____	Yes No date_____	
Is there a cyclical reinspection program in place?	Yes No	Yes No	
If yes,	number of years _____ ending FY _____ % properties completed to date _____	number of years _____ ending FY _____ % properties completed to date _____	
System on which your personal property accounts are listed and valued:			
504/local utilities: net book Yes ☐ No ☐ If no, appraisen/contractor*			

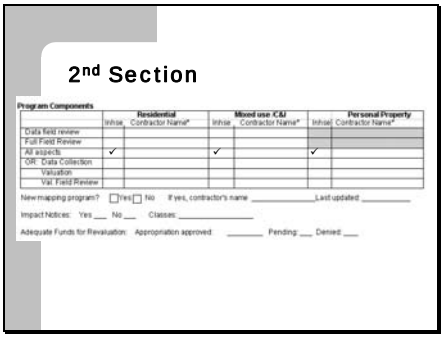
Slide 159

1st Section

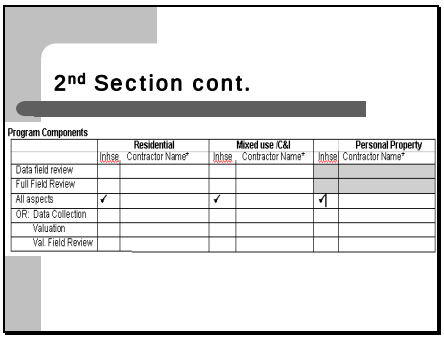
Background

Since the last certification:	Residential	Mixed use/C&I	Personal Property
New valuation system	Yes No	Yes No	Yes No
If yes, name of new system			
Installation completed	FY	FY	FY
Has your department done a formal data quality study?	Yes No date_____	Yes No date_____	
Is there a cyclical reinspection program in place?	Yes No	Yes No	
If yes,	number of years _____ ending FY _____ % properties completed to date _____	number of years _____ ending FY _____ % properties completed to date _____	
System on which your personal property accounts are listed and valued:			
504/local utilities: net book Yes ☐ No ☐ If no, appraisen/contractor*			
Electric generation plant: Yes ☐ No ☐ If yes, agreement or appraisen/contractor*			

Slide 160



Slide 161



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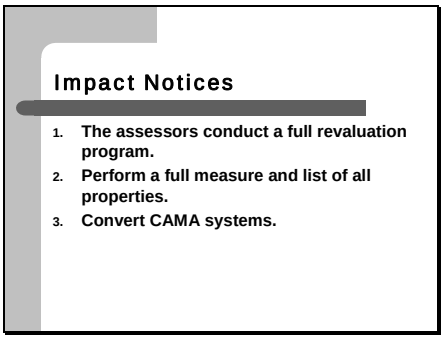
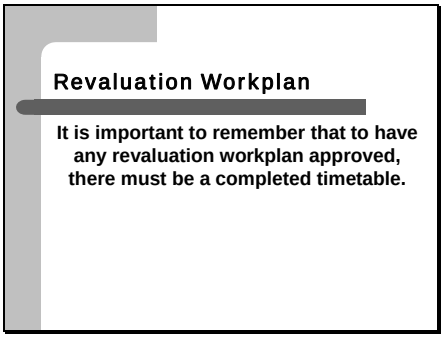
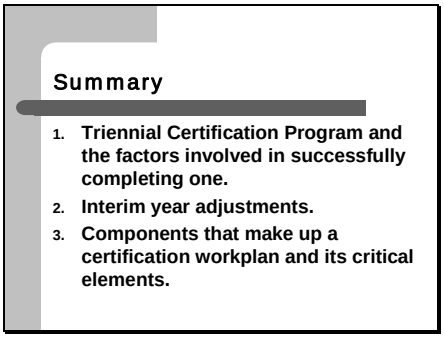


Slide 163



Slide 164



QUIZ
MASS APPRAISAL – SALES AND DATA

Answer the following questions.

1. You have just received two deeds and you need to determine the arms-length sale. Which sale below appears to be arms-length (a "good" sale)?

   a. The deed lists John Smith to Mary Smith. Your assessed value is $500,000. The sales price was $100,000.

   b. The deed lists Jane Doe to Roger White. Your assessed value is $400,000. The sales price was $425,000.

2. You drive by the property of the valid sale identified in Question 1 and notice an enclosed front porch worth $5,000 is not listed on the property record card. Find the percentage of error by taking the amount of the error and dividing it by the assessed value.

3. You have done a data quality study to verify the accuracy of your data. Below is the percentage of errors resulting from your study. Determine the median (the midpoint).

   1%
   9%
   12%
   13%
   25%

4. The median means that half your data has percentage errors in value equal or greater to the median. Based on the median determined in Question 3, what does your community need to do for data quality?

5. Correct the assessed value by adding in the amount of the missing porch to the original assessed value. Find the assessment/sales ratio of the sale by taking the corrected assessment and dividing it by the sale price. The closer to 100% the better! How did the assessor do on this property?

APPLICATION EXERCISE 1
MASS APPRAISAL – STATISTICAL ANALYSIS

<u>No. 1</u> - Answer the following questions.

1. Community A has 2,500 single-family homes. How many valid sales of single-family homes should occur to meet certification guidelines for this class?

2. Community B has 650 condos. It has 18 condo sales in the base year. Is that a sufficient sample?

3. Community C has 375 single-family homes. Over a two-year period, 8 valid sales of single-family homes occur. Does the community have to use a third year of sales?

4. Community D is using two years of sales for condos. The period covers 7/1/2006 to 6/30/2008. The community is also using two years of sales for two and three family homes covering the period 1/1/2006 to 12/31/2007. Is this acceptable?

5. Community E has 450 single-family homes. In 2007, it has 8 valid sales. It has 1 valid sale in December 2006, 2 valid sales in November 20065 and 3 valid sales in October 2006. How many months of 2006 sales does the community have to use to have an adequate sample?

No. 2 - Calculate the median ASR and COD for the following sales.

Sales Date	Map	Lot	Class	Sales Price	Current Assessment	ASR Ratio	Low/High Array	Absolute Deviation
010807	8	30B	101	391700	332700			
050107	11	129	101	185900	110000			
061507	14	13C	101	270500	194200			
080207	5A	32	101	140000	111000			
080207	5	31	101	185000	129200			
082707	23	8	101	300000	202900			
083107	13	49B	101	168000	120300			
083107	14	52	101	430000	230100			
100107	15	4G	101	210000	129900			
111607	7B	21	101	310000	266700			
121107	5	28B	101	265000	197000			

Exercise Steps.

1. Calculate the Assessment Sales Ratio for each sale.
2. Array each sale from Low to High.
3. Determine the median.
4. Calculate the Absolute Deviation for each sale.
5. Calculate the Average Absolute Deviation.
6. Calculate the Coefficient of Dispersion.

No. 3 - Calculate the median ASR and COD for the following sales.

Sales Date	Map	Lot	Class	Sales Price	Proposed Assessment	ASR Ratio	Low/High Array	Absolute Deviation
010807	8	30B	101	391700	385100			
050107	11	129	101	185900	175300			
061507	14	13C	101	270500	271100			
080207	5A	32	101	140000	136600			
080207	5	31	101	185000	204900			
082707	23	8	101	300000	287700			
083107	13	49B	101	168000	152000			
083107	14	52	101	430000	425700			
100107	15	4G	101	210000	176200			
111607	7B	21	101	310000	317000			
121107	5	28B	101	265000	274300			

Exercise Steps.

1. Calculate the Assessment Sales Ratio for each sale.

2. Array each sale from Low to High.

3. Determine the median.

4. Calculate the Absolute Deviation for each sale.

5. Calculate the Average Absolute Deviation.

6. Calculate the Coefficient of Dispersion.

APPLICATION EXERCISE 2
MASS APPRAISAL – VALUATION ADJUSTMENTS

For each of the following <u>two</u> sets of sales, determine if a pattern of inequity exists by calculating the ASR for each sale. If a pattern exists, identify what factor assessors must adjust to remedy it.

Sales Set 1

Sale 1	Sale 2	Sale 3
Single Family	Single Family	Single Family
Assessed for $300,000	Assessed for $380,000	Assessed for $312,000
Sold 5/20/07-$350,000	Sold 5/1/07-$400,000	Sold 5/15/07-$375,000
Neighborhood 4	Neighborhood 6	Neighborhood 6
Cape Style	Colonial Style	Cape Style
Built 1960	Built 2000	Built 1986
ASR	**ASR**	**ASR**

Sale 4	Sale 5	Sale 6
Single Family	Single Family	Single Family
Assessed for $270,000	Assessed for $300,000	Assessed for $315,000
Sold 4/29/07-$340,000	Sold 5/3/07-$295,000	Sold 5/25/07-$370,000
Neighborhood 5	Neighborhood 4	Neighborhood 3
Cape Style	Ranch Style	Cape Style
Built 1971	Built 1965	Built 1955
ASR	**ASR**	**ASR**

Sales Set 2

Sale 1
Single Family
Assessed for $390,000
Sold 5/20/07-$400,000
Neighborhood 5
Cape Style
Built 1985
ASR

Sale 2
Single Family
Assessed for $500,000
Sold 5/3/07-$450,000
Neighborhood 6
Colonial Style
Built 2000
ASR

Sale 3
Single Family
Assessed for $475,000
Sold 5/15/07-$425,000
Neighborhood 6
Split Level Style
Built 1975
ASR

Sale 4
Single Family
Assessed for $545,000
Sold 4/29/07-$485,000
Neighborhood 6
Contemporary Style
Built 1990
ASR

Sale 5
Single Family
Assessed for $490,000
Sold 5/1/07-$440,000
Neighborhood 6
Ranch Style
Built 1970
ASR

Sale 6
Single Family
Assessed for $435,000
Sold 5/25/07-$445,000
Neighborhood 5
Bungalow Style
Built 1930
ASR

QUIZ ANSWERS
MASS APPRAISAL – SALES AND DATA

1. You have just received two deeds and you need to determine the arms-length sale. Which sale below appears to be arms-length (a "good" sale)?

   a. The deed lists John Smith to Mary Smith. Your assessed value is $500,000. The sales price was $100,000. **NON-ARMS-LENGTH**.

   b. The deed lists Jane Doe to Roger White. Your assessed value is $400,000. The sales price was $425,000. **ARMS-LENGTH**.

2. You drive by the property of the valid sale identified in Question 1 and notice an enclosed front porch worth $5,000 is not listed on the property record card. Find the percentage of error by taking the amount of the error and dividing it by the assessed value.

   .0125 or 1.25%

3. You have done a data quality study to verify the accuracy of your data. Below is the percentage of errors resulting from your study. Determine the median (the midpoint).

   1%
   9%
   12% - median
   13%
   25%

4. The median means that half your data has percentage errors in value equal or greater to the median. Based on the median determined in Question 3, what does your community need to do for data quality?

A median of over 10% indicates a need for prompt corrective action.

5. Correct the assessed value by adding in the amount of the missing porch to the original assessed value. Find the assessment/sales ratio of the sale by taking the corrected assessment and dividing it by the sale price. The closer to 100% the better! How did the assessor do on this property?

A/S ratio is .90 or 90%. Pretty good.

APPLICATION EXERCISE 1 ANSWERS
MASS APPRAISAL – STATISTICAL ANALYSIS

No. 1.

1. Community A has 2,500 single-family homes. How many valid sales of single-family homes should occur to meet certification guidelines for this class? **50.**

2. Community B has 650 condos. It has 18 condo sales in the base year. Is that a sufficient sample? **YES.**

3. Community C has 375 single-family homes. Over a two-year period, 8 valid sales of single-family homes occur. Does the community have to use a third year of sales? **NO.**

4. Community D is using two years of sales for condos. The period covers 7/1/2006 to 6/30/2008. The community is also using two years of sales for two and three family homes covering the period 1/1/2006 to 12/31/2007. Is this acceptable? **NO**.

5. Community E has 450 single-family homes. In 2007, it has 8 valid sales. It has 1 valid sale in December 2006, 2 valid sales in November 2006 and 3 valid sales in October 2006. How many months of 2006 sales does the community have to use to have an adequate sample? **12 months, a full second year is required regardless of meeting the 2% OR 10 Rule.**

No. 2.

Sales Date	Map	Lot	Class	Sales Price	Current Assessment	(1) ASR Ratio	(2) Low/High Array	(4) Absolute Deviation
083107	14	52	101	430000	230100	**54.0%**	**1**	**18.0%**
050107	11	129	101	185900	110000	**59.0%**	**2**	**13.0%**
100107	15	4G	101	210000	129900	**62.0%**	**3**	**10.0%**
082707	23	8	101	300000	202900	**68.0%**	**4**	**4.0%**
080207	5	31	101	185000	129200	**70.0%**	**5**	**2.0%**
061507	14	13C	101	270500	194200	**72.0%**	**6**	**0.0%**
083107	13	49B	101	168000	120300	**72.0%**	**7**	**0.0%**
121107	5	28B	101	265000	197000	**74.0%**	**8**	**2.0%**
080207	5A	32	101	140000	111000	**79.0%**	**9**	**7.0%**
010807	8	30B	101	391700	332700	**85.0%**	**10**	**13.0%**
111607	7B	21	101	310000	266700	**86.0%**	**11**	**14.0%**

3) Median equals **72.0%**

5) Average of Absolute Deviations are **7.5%**

6) COD is **10.48**

Step 1	7.55% ÷ 72%	0.1048
Step 2	0.1048 x 100	10.48

No. 3.

Sales Date	Map	Lot	Class	Sales Price	Proposed Assessment	(1) ASR Ratio	(2) Low/High Array	(4) Absolute Deviation
010807	8	30B	101	391700	385100	**98.0%**	**5**	**0.0%**
050107	11	129	101	185900	175300	**94.0%**	**3**	**4.0%**
061507	14	13C	101	270500	271100	**100.0%**	**8**	**2.0%**
080207	5A	32	101	140000	136600	**98.0%**	**6**	**0.0%**
080207	5	31	101	185000	204900	**111.0%**	**11**	**13.0%**
082707	23	8	101	300000	287700	**96.0%**	**4**	**2.0%**
083107	13	49B	101	168000	152000	**90.0%**	**2**	**8.0%**
083107	14	52	101	430000	425700	**99.0%**	**7**	**1.0%**
100107	15	4G	101	210000	176200	**84.0%**	**1**	**14.0%**
111607	7B	21	101	310000	317000	**102.0%**	**9**	**4.0%**
121107	5	28B	101	265000	274300	**104.0%**	**10**	**6.0%**

3) Median equals **98.00%**

5) Average of Absolute Deviations are **4.91%**

6) COD is **5.01**

Step 1	4.91% ÷ 98%	0.0501
Step 2	0.1048 x 100	5.01

APPLICATION EXERCISE 2 ANSWERS
MASS APPRAISAL – VALUATION ADJUSTMENTS

Sales Set 1
Cape Cod style homes are underassessed and must be adjusted

Sale 1	Sale 2	Sale 3
Single Family	Single Family	Single Family
Assessed for $300,000	Assessed for $380,000	Assessed for $312,000
Sold 5/20/06-$350,000	Sold 5/1/06-$400,000	Sold 5/15/06-$375,000
Neighborhood 4	Neighborhood 6	Neighborhood 6
Cape Style	Colonial Style	Cape Style
Built 1960	Built 2000	Built 1986
ASR .86	**ASR .95**	**ASR .83**

Sale 4	Sale 5	Sale 6
Single Family	Single Family	Single Family
Assessed for $270,000	Assessed for $300,000	Assessed for $315,000
Sold 4/29/06-$340,000	Sold 5/3/06-$295,000	Sold 5/25/06-$370,000
Neighborhood 5	Neighborhood 4	Neighborhood 3
Cape Style	Ranch Style	Cape Style
Built 1971	Built 1965	Built 1955
ASR .79	**ASR 1.02**	**ASR .85**

Sales Set 2
Neighborhood 6 is being overassessed and must be adjusted

Sale 1	Sale 2	Sale 3
Single Family	Single Family	Single Family
Assessed for $390,000	Assessed for $500,000	Assessed for $475,000
Sold 5/20/06-$400,000	Sold 5/3/06-$450,000	Sold 5/15/06-$425,000
Neighborhood 5	Neighborhood 6	Neighborhood 6
Cape Style	Colonial Style	Split Level Style
Built 1985	Built 2000	Built 1975
ASR .98	**ASR 1.11**	**ASR 1.12**

Sale 4	Sale 5	Sale 6
Single Family	Single Family	Single Family
Assessed for $545,000	Assessed for $490,000	Assessed for $435,000
Sold 4/29/06-$485,000	Sold 5/1/06-$440,000	Sold 5/25/06-$445,000
Neighborhood 6	Neighborhood 6	Neighborhood 5
Contemporary Style	Ranch Style	Bungalow Style
Built 1990	Built 1970	Built 1930
ASR 1.12	**ASR 1.11**	**ASR .98**